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REMARKS

This application has been reviewed in light of the Office Action of January 25, 2005. Claims 1-24 are pending. Claims 1-4, 6, 8-11, 13, 14, 16-22, and 24 are rejected, and claims 5, 7, 12, 15, and 23 are objected to. (The Office Action Summary does not mention claim 17, but there is a rejection of this claim in the Detailed Action.) In response, new claim 25 is added, and the following remarks are submitted. Support for new claim 25 is found at least at [0031] of the application as originally filed; no new matter is presented. Reconsideration of this application, as amended, is requested.

Applicant acknowledges the indication of allowable subject matter in the objected-to claims, but has not amended the claims to independent form at this time because it is believed that the parent independent claims are allowable over the art in each case.

Claims 1, 3, 4, 6, 8-10, 13-14, 16, and 18 are rejected under 35 USC 103 over Ikuno US patent 5,980,103 in view of Hunter US Patent 5,980,206. Applicant traverses this ground of rejection.

Ikuno teaches a thermal fatigue test of a test piece 40 that "has a middle portion of circular cross section with a constant sectional area similar to a test piece used in a tensile test..." and thick end portions as attachments. (col. 5, lines 21-27) As far as Applicant can find, Ikuno does not allow for the use of any other configuration of the test piece 40 and requires a cylindrical test section, which inherently has no protruding rib or other feature, thereby teaching directly away from the use of a rib in the test piece 40. It is a well-established principle of law that a prima facie case of obviousness may not properly be based on a reference which teaches away from the present invention as recited in the claims.

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from

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the path that was taken by the applicant. In re Sponnoble, 160 USPQ 237 244 (CCPA 1969)...As "a useful general rule,"..."a reference that 'teaches away' can not create a prima facie case of obviousness." In re Gurley, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994)"

Ikuno may therefore not be used as a reference in rejecting the present claims.

Hunter teaches a monolithic structure. The monolithic structural member 10 shown in Figure 3 was tested in four-point bending fatigue loading as depicted in Figure 4 and discussed at col. 6, line 49-col. 7, line 13. The explanation of the rejection suggests that Hunter teaches performing thermal mechanical fatigue on this specimen, but Applicant must respectfully disagree. There is no suggestion that the temperature is changed, and Hunter describes his testing simply as fatigue in four-point bending. If the rejection is maintained. Applicant asks that the explanation of the rejection be modified to remove any suggestion that Hunter teaches thermal mechanical fatigue.

Hunter has nothing to do with the problem of assessing thermal mechanical fatigue. Stated alternatively, Hunter is not within the scope and content of the prior art that may be used in forming a sec. 103 rejection. Its teachings are therefore not properly combined with the teachings of Ikuno. To be analogous art and properly used in forming a sec. 103 rejection, a reference must be concerned with the same problem as another reference and the claims which are being addressed. See, for example, Medtronic, Inc. v. Cardiac Pacemaker, Inc., 220 USPQ 97, 104 (Fed. Cir. 1983), stating: "Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of others faced with rate-limiting problems." In the present case, the inventor was concerned with a problem in assessing thermal mechanical fatigue as indicated in the Title and throughout the Specification. Hunter has nothing at all to do with assessing thermal mechanical fatigue or with specimens for assessing thermal mechanical fatigue, and therefore is not properly within the scope of the prior art. It is therefore not properly applied in rejecting the present claims and its teachings were not properly combined with those of Ikuno.

Furthermore, even if these two references are used in forming a rejection, contrary to the principles of patent law, they do not teach the presently claimed invention.

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The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish <u>prima facie</u> obviousness of a claimed invention, <u>all claim limitations must be taught or suggested by the prior art. In re Royka</u>, 490 F2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claim 1 recites in part:

"thermally cycling the test specimen through at least one test cycle, wherein in each test cycle the rib is heated to a higher rib temperature and thereafter cooled to a lower rib temperature;" [emphasis added]

Neither reference has any such teaching. Ikuno teaches the use of the test piece 40 that has no rib, and Hunter teaches the testing of the monolithic structural member 10 but without heating or cooling the rib.

The rejection is assembled by selecting only the helpful teachings of each reference, and ignoring the unhelpful teachings. This approach, not giving weight to the teachings in the references that are contrary to the approach of the application under examination, in this manner is a <u>per se</u> hindsight reconstruction and is improper. See, for example, <u>In re Mercer</u>, 185 USPQ 774, 778 (CCPA 1975).

The present rejection is a sec. 103 combination rejection. It is well established that a proper sec. 103 combination rejection requires more than just finding teachings in the references of the elements recited in the claim (but which was not done here). To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2143 and 2143.01. See also, for example, In re Fine, 5

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USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under section 103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the Examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992),"

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)."

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"A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd.Pat.App.& Inter. 1993)."

Here, the Examiner sets forth no objective basis for combining the teachings of the references in the manner used by this rejection, but rather selects the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. The rationale urged in the explanation of the rejection is set forth in the sentence bridging pages 2-3 of the Office Action. The problem with this argument is that the test apparatus of Ikuno is not equipped with fourpoint bending loading to test the monolithic structural member 10 of Hunter in the manner required by Hunter. If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference.

The explanation of the rejection (Office Action, page 3, lines 5-7) suggests a rationale for combining the teachings to "further improve the strength and stiffness of said specimen...and to acquire values and observations that represent the results obtained in a reliable and efficient manner." There is no evidence that using the monolithic structural member 10 of Hunter instead of the test piece 40 of Ikuno would improve the thermal mechanical fatigue test specimen or thermal mechanical fatigue test results in any way. Ikuno certainly does not suggest that the test piece 40 is inadequate in any manner. Nor is there any evidence that the proposed approach would improve the reliability and efficiency of the thermal mechanical fatigue test results Hunter does not deal with thermal mechanical fatique, so there is no evidence as to whether his test specimens would be useful in thermal mechanical fatigue. Applicant respectfully suggests that the rationale presented in the explanation of the rejection is pure speculation and not supported in the art.

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Lest it be suggested that the test apparatus of Ikuno be equipped with four-point loading, Applicant calls attention to MPEP 2143.01, which provides that, in constructing a sec. 103 rejection, the proposed modification cannot change the principle of operation of a reference. The principle of operation of Ikuno's device is that no external loading is applied to the test piece 40 other than lengthwise loading through the holders 41, 42, see Figure 7-8 of Ikuno and the related discussion. There is certainly no four-point bending of the test piece 40 of Ikuno. Ikuno's principle of operation would have to be modified if any attempt were made to equip the test apparatus of Ikuno with four-point loading as required by Hunter. MPEP 2143.01 further provides that, in constructing a sec. 103 rejection, the proposed modification cannot render the prior art unsatisfactory for its intended purpose. In the approach of Ikuno, the test piece 40 must be grasped between the holders 41, 42. If an attempt were made to substitute the monolithic structural member 10 of Hunter for the cylindrical test piece 40 specified by Ikuno, then the monolithic structural member 10 of Hunter would have to be grasped between holders 41, 42. In that case, any attempt to apply four-point loading as required by Hunter would render the stress state within the monolithic structural member 10 undefined, and would likely damage the holders 41, 42 by bending them sideways. And for this reason, the requirement of MPEP 2143.02 that, in combining the teachings of two references, there must be a reasonable expectation of success in the combination, would almost certainly be violated.

Applicant therefore submits that any attempt to combine the teachings of Ikuno and Hunter is questionable because the approaches cannot be combined in any operable fashion.

Regarding claim 3, the same issues arise.

Claim 4 recites in part: "preparing the test specimen with at least one slot in the rib". Hunter teaches no configuration of the monolithic structural member 10 with a slot in the rib. Applicant believes that the explanation of the rejection (sentence bridging pages 3-4 of the Office Action) is referencing the space between the ribs.

Claim 6 recites in part: "preparing the test specimen with more than one slot in the rib". Hunter teaches no configuration of the monolithic structural member 10 with a slot in the rib, or two slots in the rib. The explanation of the rejection refers to the "hollow arched portion in the center between every leg of the rib" (page 4, line 12 of the Office Action, emphasis added), not a slot in the rib as recited in the claim.

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Each of claims 8-10 recites numerical limitations. The discussion of these claims in the paragraph bridging pages 4-5 of the Office Action does not attempt to show that either reference has such a teaching. Instead, the explanation of the rejection relies on Gardner v. TEC Systems. As discussed in the Specification, the base desirably has a relatively large size and mass as compared with the rib, in order to properly constrain the expansion and contraction of the rib. There is no such concern with the monolithic structural member 10 of Hunter, because Hunter has no teaching of heating and cooling that would cause expansion and contraction.

Claim 13 recites in part: "thermally cycling the [ribbed] test specimen in a plurality of test cycles" [bracketed material added]. As discussed above, the test piece 40 of Ikuno has no rib, and the monolithic structural member 10 of Hunter is not heated or cooled. There is no objective reason to select only the helpful portions of each reference in an attempt to reconstruct the invention of claim 24.

Claim 14 recites in part: "thermally cycling the [ribbed] test specimen by general heating" [bracketed material added]. As discussed above, the test piece 40 of Ikuno has no rib, and the monolithic structural member 10 of Hunter is not heated or cooled. The references therefore cannot teach thermally cycling a ribbed test specimen by general heating.

Claim 16 recites in part: "heating the rib to the higher rib temperature, holding the rib at the higher rib temperature for a period of time, and thereafter cooling the rib to a lower rib temperature". The explanation of the rejection makes the statement that "Ikuno teaches...holding the rib at the higher rib temperature...". (Office Action, page 6, lines 4-6) Ikuno has no teaching of a rib at all, and can have no teaching of holding a rib at a higher rib temperature.

The rejection of claim 18 involves the same issues as that of claim 1.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claim 2 is rejected under 35 USC 103 over Ikuno in view of Hunter, and further in view of Olson US Patent 4,933,239. Applicant traverses this ground of rejection.

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Claim 2 depends from claim 1. The combined teachings of Ikuno and Hunter do not teach the limitations of claim 1 for the reasons stated above, which are incorporated here. Olson does not alter this lack of teachings.

Olson is relied upon for its teaching of the existence of nickel-base superalloys. In re Leshin is relied upon for the principle that it is "within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice." In this case, the prior art of record presents no such design choice, because there is no teaching in the prior art of record that a nickel-base superalloy could be thermal fatigue tested using a ribbed specimen.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 11, 19, 21, and 24 are rejected under 35 USC 103 as unpatentable over Ikuno in view of Hunter, and further in view of Eichenbrenner US Patent 3,795,134. Applicant traverses this ground of rejection.

Ikuno and Hunter have been discussed previously, and that discussion is incorporated here. Ikuno and Hunter are not properly applied in forming the rejection, the combination of teachings does not teach the claim limitations, and there is no basis for forming the combination of teachings.

Eichenbrenner teaches the use of a flat-plate test specimen 11 with shims 13 and guide members 12 and 14 surrounding the four sides of the test specimen 11. The guide members 12 and 14 are necessarily positioned against the flat faces of the test specimen 11 to prevent it from buckling in compression (col. 2, lines 34-54), the whole point of Eichenbrenner's invention. The approach of Eichenbrenner is not taught to be applicable for any other shape of test specimen.

Claim 11 depends from claim 1, whose limitations are not taught by the combination of Ikuno and Hunter for the reasons stated above, and which are incorporated here. Eichenbrenner does not remedy this lack of teachings, and in fact makes the situation worse because it teaches yet another configuration of a test specimen 11.

Claim 11 further recites in part:

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"maintaining the rib in compression while the rib is at the higher rib temperature"

None of the references has such a teaching. Eichenbrenner teaches a flat test specimen that cannot have a rib because the guide members 12 and 14 must press against the sides of the flat test specimen for Eichenbrenner's approach to be operable.

Claim 19 recites in part a test specimen having

"a rib extending outwardly from the base, wherein the rib includes a slot therein".

None of the references teaches a slot in a rib. At most, Hunter teaches a space between the ribs.

Claim 19 further recites in part:

"thermally cycling the test specimen in at least one test cycle, wherein in each test cycle the rib is heated to a higher rib temperature and thereafter cooled to a lower rib temperature"

Among the three references, there are teachings of three configurations of articles. Ikuno teaches thermally cycling a cylindrical test piece 40. Eichenbrenner teaches thermally cycling a flat plate specimen 11. The only reference that arguably teaches a monolithic structural member 10 having a rib is Hunter. But Hunter also teaches that his monolithic structural member 10 is tested in four-point fatigue loading, without any teaching of thermal mechanical fatigue.

The rejection is assembled by selecting only the helpful teachings of each reference, and ignoring the unhelpful teachings. This approach, not giving weight to the teachings in the references that are contrary to the approach of the application under examination, in this manner is a per se hindsight reconstruction and is improper. See, for example, in re Mercer, 185 USPQ 774, 778 (CCPA 1975).

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Applicant incorporates the prior discussion of the need for an objective basis for combining the teachings of the references. In this case, the rationale for combining the teachings is "to facilitate the evaluation of the specimen being tested in a more realistic manner." (Office Action, page 8, lines 3-4 as to claim 11; page 9, lines 1-2 "more reliable and efficient manner" as to claim 19, and page 9, lines 11-12 as to claim 19). There is no factual basis of record for believing that the approach of Ikuno is not realistic, as suggested by this rationale. If the rejection is maintained, Applicant asks that the Examiner set forth the factual basis underlying the assertion that the approach of Ikuno is not realistic.

Claim 21 recites in part: "preparing the test specimen having a mass of the base at least 25 times larger than a mass of the rib". Applicant incorporates the prior discussion of claim 8.

Claim 24 recites in part: "thermally cycling the [ribbed] test specimen in a plurality of test cycles". As discussed above, the test piece 40 of Ikuno has no rib, the specimen 11 of Eichenbrenner has no rib, and the monolithic structural member 10 of Hunter is not heated or cooled. There is no objective reason to select only the helpful portions of each reference in an attempt to reconstruct the invention of claim 24.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claim 20 is rejected under 35 USC 103 over Ikuno in view of Hunter and Eichenbrenner as applied to claim 19, and further in view of Olson. Applicant traverses this ground of rejection.

Claim 20 depends from claim 19, whose limitations are not taught by the combination of Ikuno, Hunter, and Eichenbrenner for the reasons stated above, and which are incorporated here. Olson does not remedy this lack of teachings, and in fact does not deal with thermal mechanical fatigue at all.

Claim 2 depends from claim 1. The combined teachings of Ikuno and Hunter do not teach the limitations of claim 1 for the reasons stated above, which are incorporated here. Olson does not alter this lack of teachings.

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Olson is relied upon for its teaching of the existence of nickel-base superalloys. In re Leshin is relied upon for the principle that it is "within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice." In this case, the prior art of record presents no such design choice, because there is no teaching that a nickel-base superalloy would be thermal fatigue tested using a ribbed specimen.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 17 and 22 are rejected under 35 USC 103 over Ikuno in view of Hunter as applied to claim 1 (for claim 17) and over Ikuno in view of Hunter and Eichenbrenner (for claim 22), and further in view of Otobe in each case. Applicant traverses this ground of rejection.

Claim 17 depends from claim 1 and incorporates its limitations. The combination of Ikuno and Hunter does not teach the limitations of claim 1, and Otobe does not remedy this lack of teachings. Similarly, claim 22 depends from claim 19 and incorporates its limitations. The combination of Ikuno, Hunter, and Eichenbrenner does not teach the limitations of claim 1, and Otobe does not remedy this tack of teachings.

Otobe has nothing to do with specimens for assessing thermal mechanical fatigue. Stated alternatively, Otobe is not within the scope and content of the prior art that may be used in forming a sec. 103 rejection. Its teachings are therefore not properly combined with the teachings of the other references. To be analogous art and properly used in forming a sec. 103 rejection, a reference must be concerned with the same problem as another reference and the claims which are being addressed. See, for example, Medtronic, Inc. v. Cardiac Pacemaker, Inc., 220 USPQ 97, 104 (Fed. Cir. 1983), stating: "Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of others faced with rate-limiting problems." In the present case, the inventor was concerned with a problem in assessing thermal mechanical fatique, see the Title, the Background section of the Specification, and the remainder of the Specification. Otobe has nothing at all to do with assessing thermal mechanical fatigue, and therefore is not properly within the scope of the prior art. It is therefore not properly applied in rejecting the present claims.

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The explanation of the rejection (Office Action, page 11, lines 13-15) suggests a rationale for combining the teachings of "making said test more reliable and accurate" There is no evidence that the approach of Ikuno is not "reliable and accurate", or that using the approach taught by Otobe would improve the reliability and/or accuracy of the approach taught by Otobe and as modified. Applicant respectfully suggests that the rationale presented in the explanation of the rejection is pure speculation and not supported in the art.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

CONCLUSION

In view of the above, Applicant respectfully requests reconsideration of the Application and withdrawal of the outstanding objections and rejections. As a result of the amendments and remarks presented herein, Applicant respectfully submits that claims are not anticipated by nor rendered obvious by the cited art either alone or in combination and thus, are in condition for allowance. As the claims are not anticipated by nor rendered obvious in view of the applied art, Applicant requests allowance of all of the remaining claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant.

This Amendment/Response has been filed within three (3) months of the mailing date of the Office Action. It is believed that the only fee due with the filing of this paper is \$50 for addition of a single claim in excess of twenty. The Commissioner is hereby authorized to deduct this amount and any other fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

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Applicant respectfully requests entry of the above amendment and allowance of the claims.

Respectfully submitted,

McNees Wallace & Nurick LLC

#50,311

Dated: April 13, 2005

Phone: (717) 237-5226

Fax: (717) 237-5300

Shawn K. Leppo Reg. No. 50,311 100 Pine Street P.O. Box 1166

Harrisburg, PA 17108-1166

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Attorney Docket No.: 124211/11941 (21635-0123) Application No.: 10/792,158 Filed: March 3, 2004

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